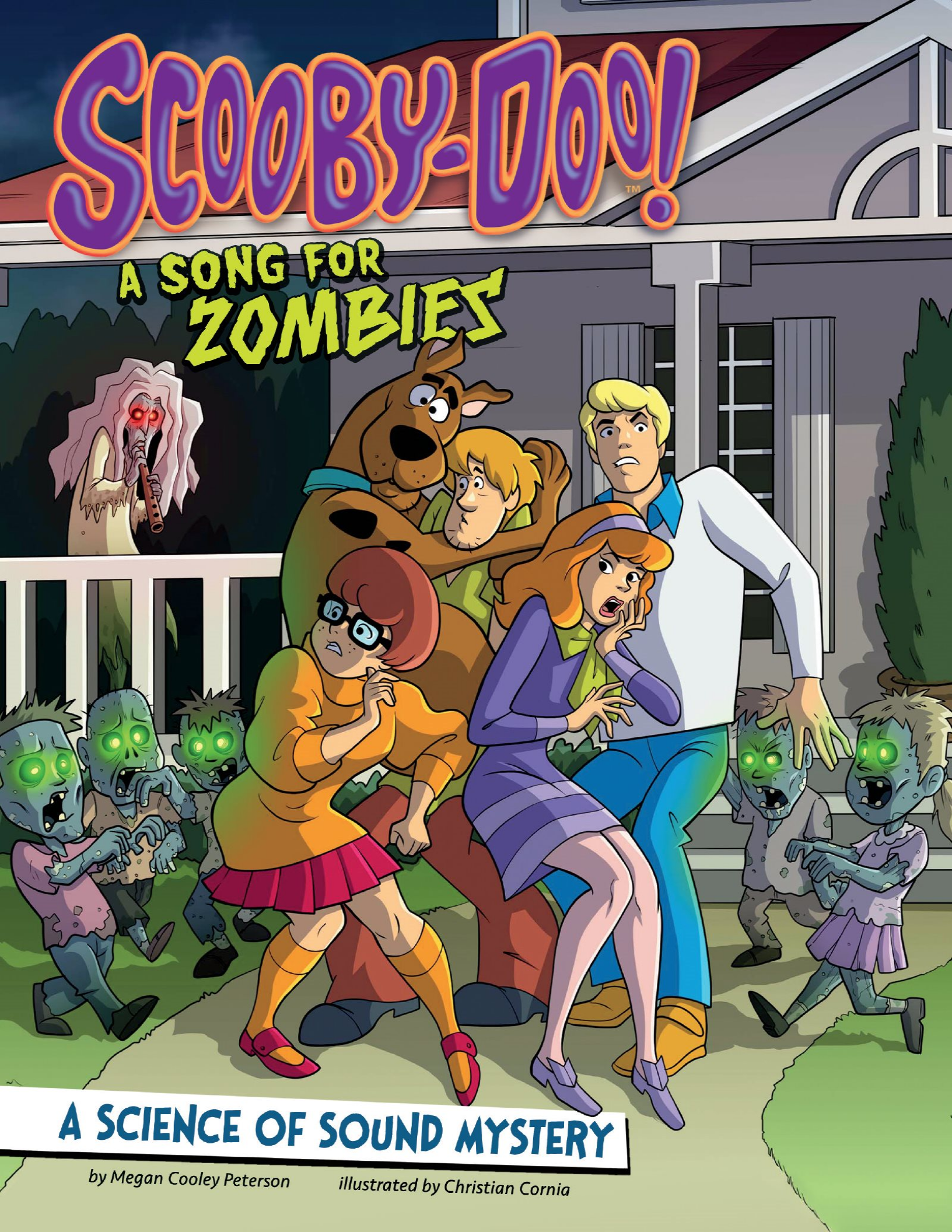
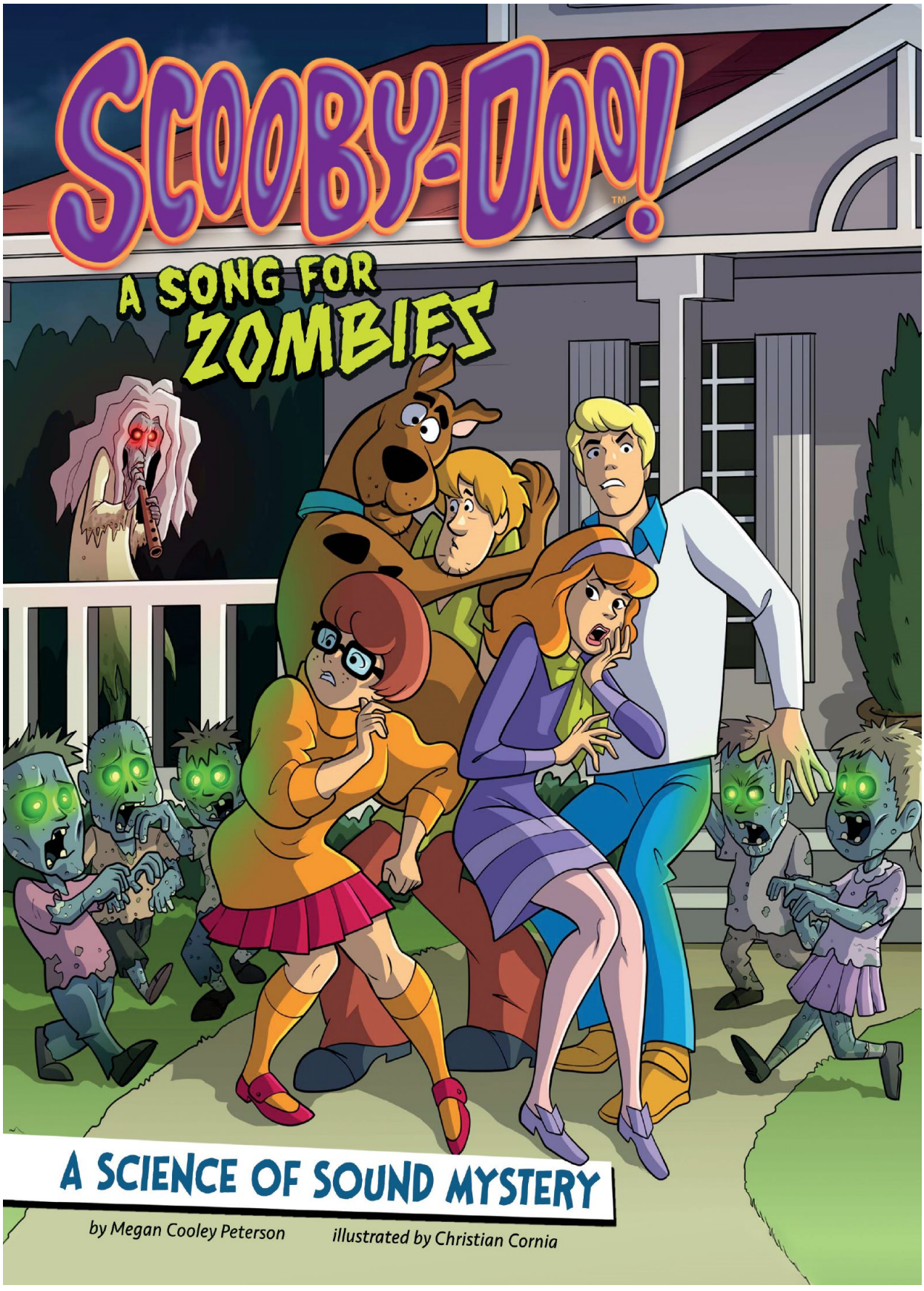


A SCIENCE OF SOUND MYSTERY

by Megan Cooley Peterson illustrated by Christian Cornia


SCOOBY-DOO!™
A SONG FOR ZOMBIES
A SCIENCE OF SOUND MYSTERY
by Megan Cooley Peterson
illustrated by Christian Cornia

SCOOBY-DOO!™

A SCIENCE OF SOUND MYSTERY

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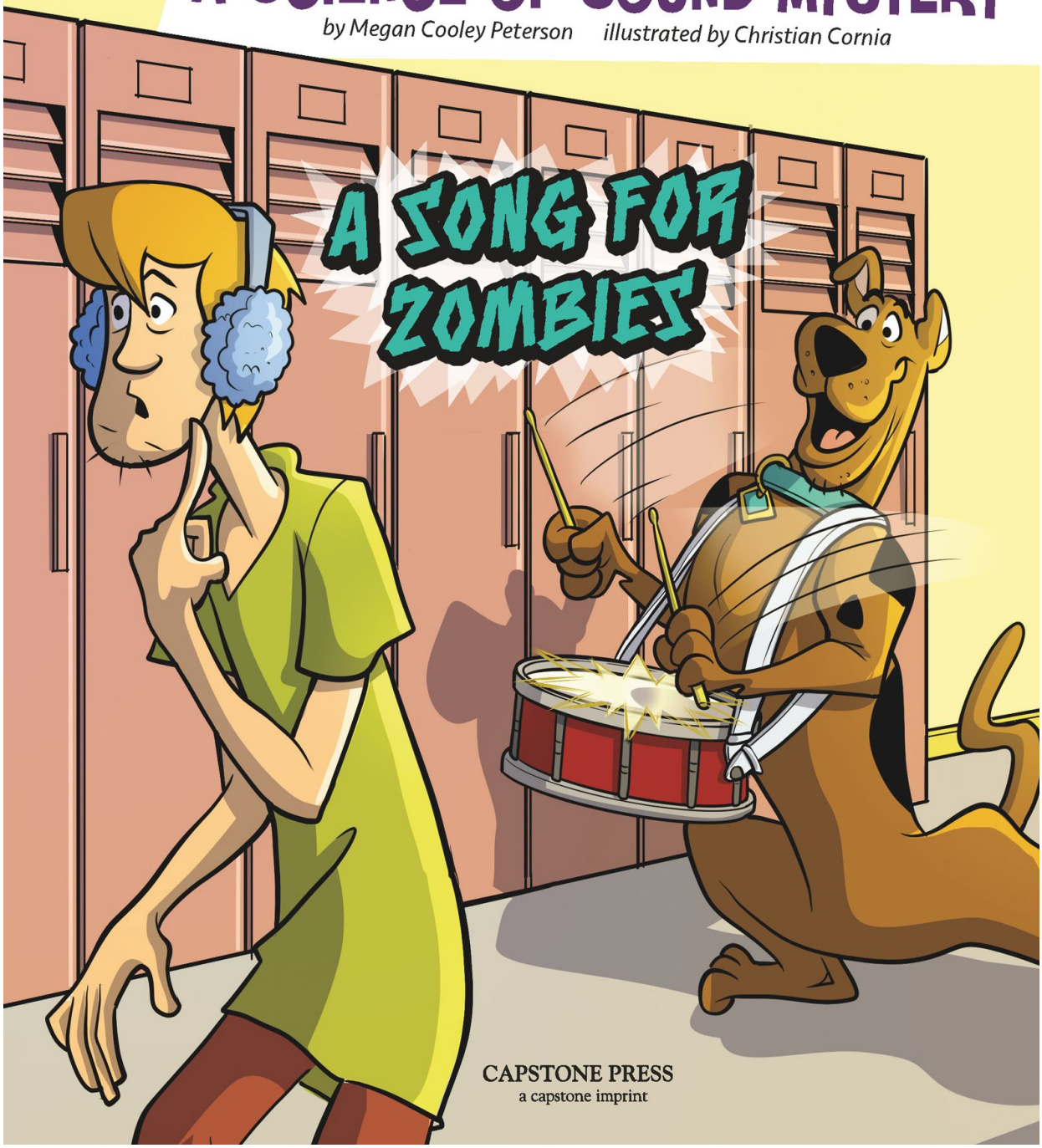

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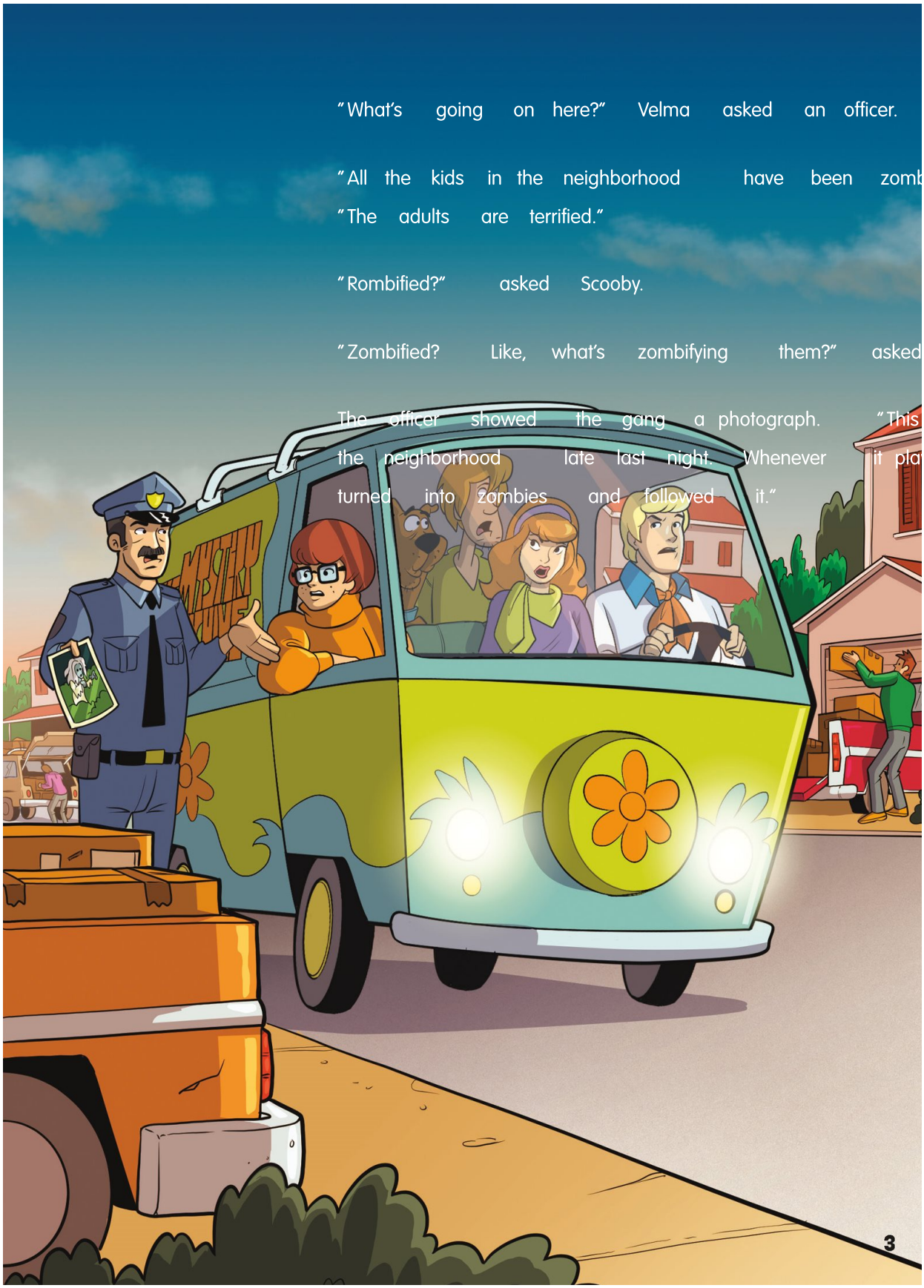
Scooby- Doo and the gang drove home after a long

"Man, I love my new music class," said Shaggy. "I
all day, every day."

Velma covered her ears. "I don't think my eardrums

"Watch out for those kids, Fred!" shouted Daphne.

Fred slammed on the brakes. "They don't look like


"What's going on here?" Velma asked an officer.
"All the kids in the neighborhood have been zomb
"The adults are terrified."
"Rombified?" asked Scooby.
"Zombified? Like, what's zombifying them?" asked
The officer showed the gang a photograph. "This
the neighborhood late last night. Whenever it pla
turned into zombies and followed it."
3

"I'm confused," said Shaggy. "The kids were asleep in their beds. How did the music get inside their houses?"

"Sound travels through air, water, and even walls, if it's loud enough," Daphne said.

"Sound is a kind of energy, like heat and light," Velma explained. "When something vibrates, like your vocal cords or an instrument, it makes sound waves. The waves cause molecules to move. As the molecules bump into each other, they make sound."

FACT FILE

Sound travels through the air at 1,129 feet (344 meters) per second. It travels through steel at 16,404 feet (5,000 m) per second.

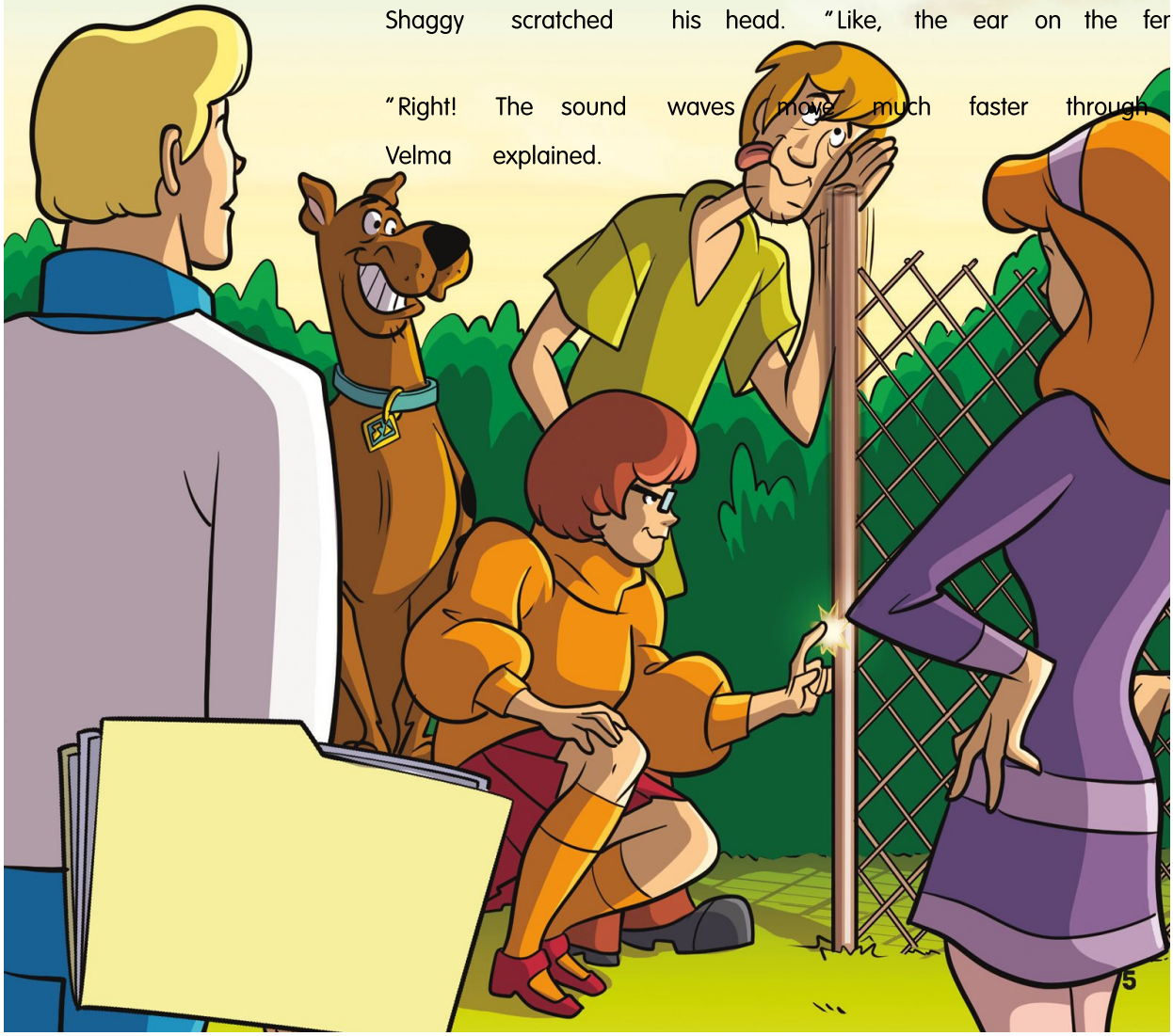
"Sound waves move faster through denser materials Fred said. "The molecules are packed together close pass more easily from molecule to molecule."

"You've lost me again," Shaggy said.

"Imagine this fence is a block long," Velma said. "If fence at one end of the block, and I hit the fence wi end of the block, which ear do you think would hear

Shaggy scratched his head. "Like, the ear on the fer

"Right! The sound waves move much faster through Velma explained.



FACT FILE

In outer space there is no sound. There is no air or other material for sound waves to travel through.

"Man, I hope those creepy kids don't take over
"Re reither," agreed Scooby.
"Like, I need a snack and so
added Shaggy.
"Oh, brother,"

A girl tapped Fred's shoulder. "Hi, Fred. I wanted to remind you that we're meeting in the library after school."

"Thanks for tutoring me on my government homework, Sarah," Fred said. "See you then!"

"Zoinks!" shouted Shaggy when a po
dropped a book with a bang. "That
"You can uncover your pinna now," V
BLAM

"Did you say 'dinna'? I could go for some dinner!" Shaggy said, rubbing his stomach.

"No, *pinna* . It's your outer ear," Velma explained. "Its main job is to gather sound waves."

"Then the sound waves hit your eardrum," Fred continued. "The eardrum is a thin piece of tightly stretched skin. It turns sound waves into vibrations."

"Small bones move these vibrations to your cochlea," added Velma. "It's a small tube that sends sound signals to your brain."

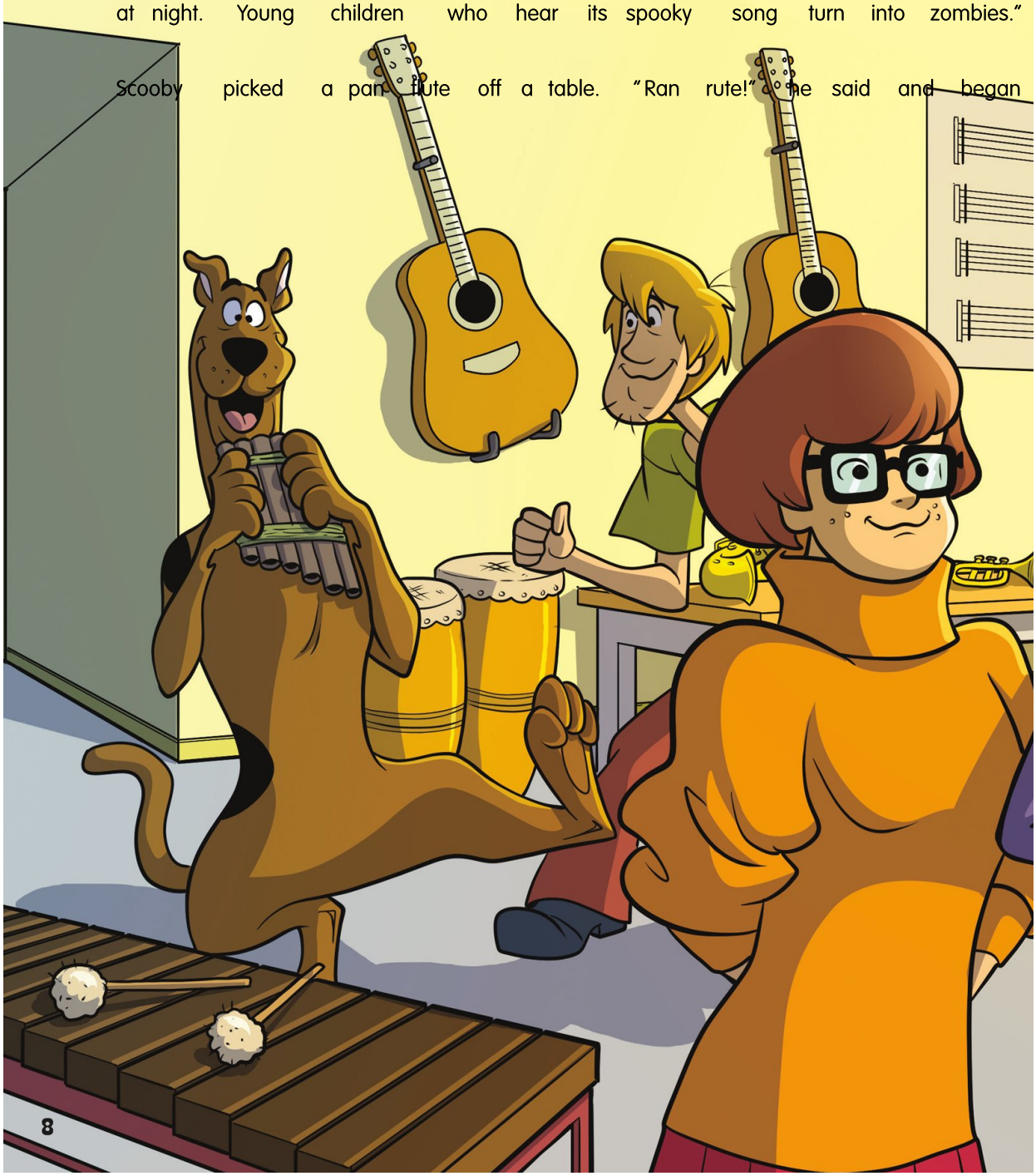
Daphne crouched over the book. "Look! It's a drawing of that pan flute- playing zombie. I wonder why our new music teacher has it?"

"Only one way to find out," said Fred.

"Mr. Green?" asked Daphne. "Do you recognize this creature?"

"Ah, yes," he said. "According to the legend, this zombie plays the p
at night. Young children who hear its spooky song turn into zombies."

Scooby picked a pan flute off a table. "Ran rute!" he said and began



"The pan flute is a rather unusual instrument. have one?" Velma asked.

Mr. Green snatched the flute away from Scooby my travels. Now, please, go to your next class."

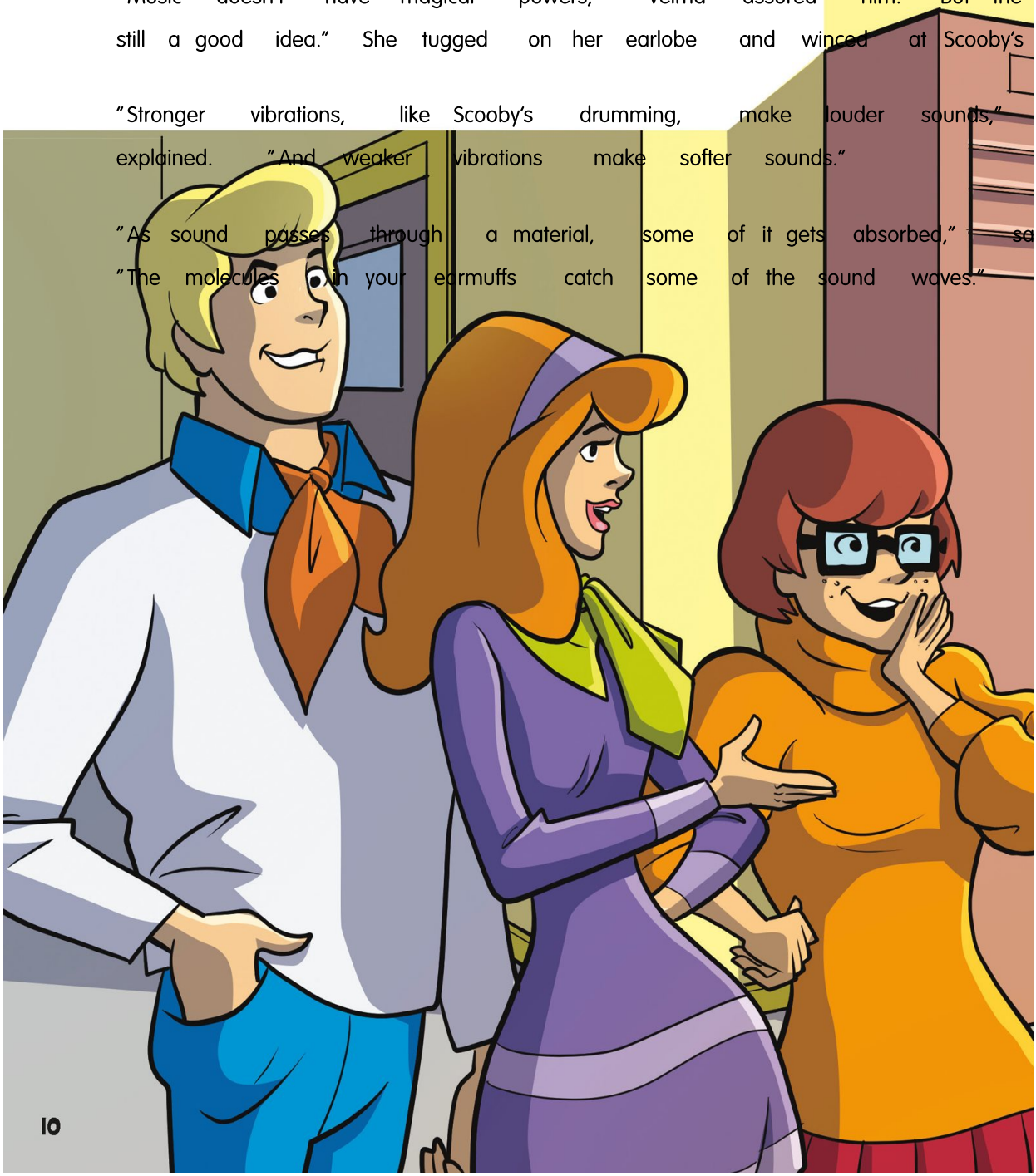
"Shaggy, why are you wearing earmuffs?" Daphne asked.

"Music has, like, magical powers!" exclaimed Shaggy. "I'm not taking

"Music doesn't have magical powers," Velma assured him. "But the still a good idea." She tugged on her earlobe and winced at Scooby's

"Stronger vibrations, like Scooby's drumming, make louder sounds," explained. "And weaker vibrations make softer sounds."

"As sound passes through a material, some of it gets absorbed," sa "The molecules in your earmuffs catch some of the sound waves."

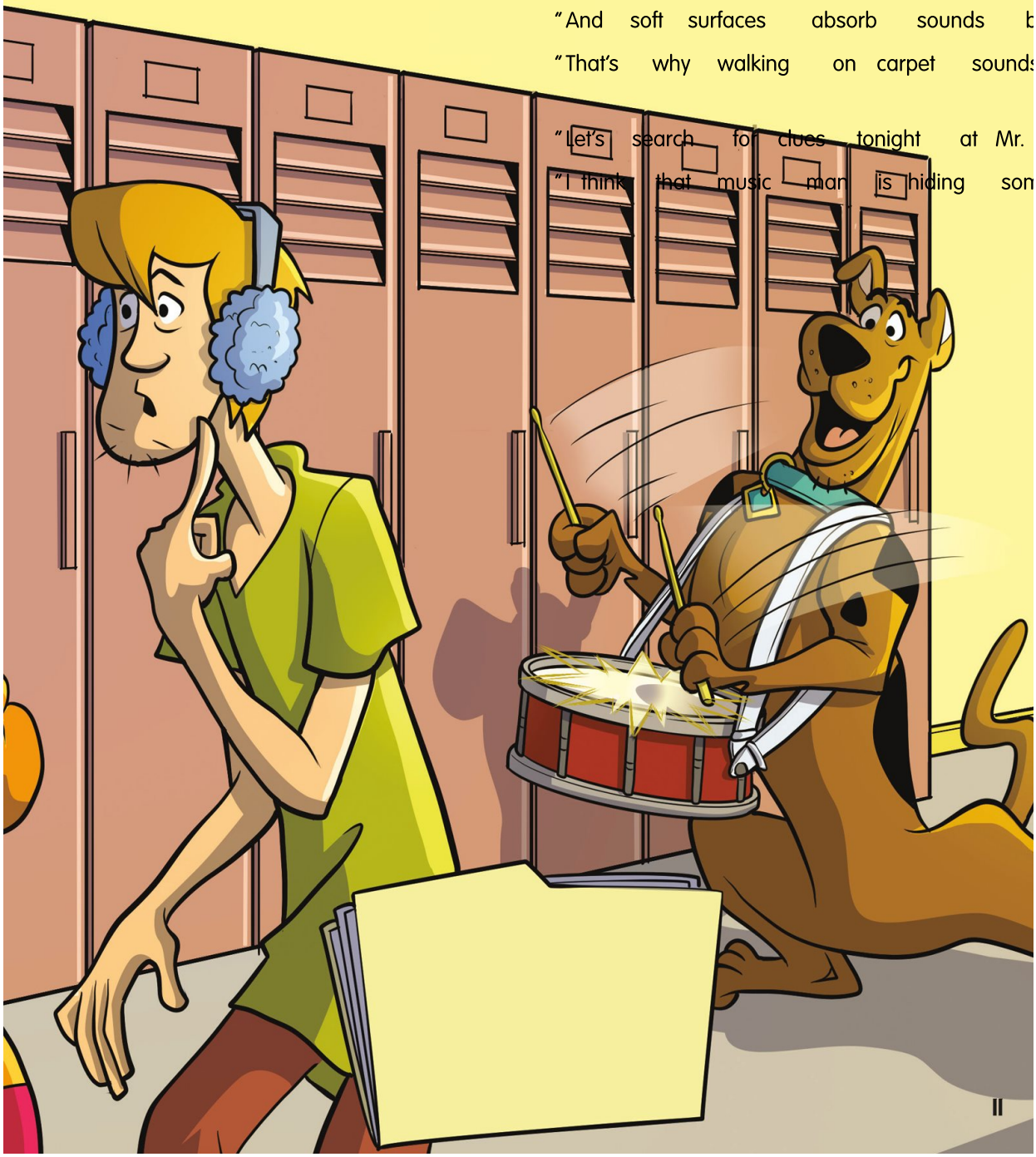


"Your earmuffs will easily absorb sof
"But they won't absorb loud sounds

Scooby kept banging on the drums.

"And soft surfaces absorb sounds b
"That's why walking on carpet sounds

"Let's search for clues tonight at Mr.
"I think that music man is hiding som



FACT FILE

Place your hand on your
and whisper. Then speak
Can you feel your throat
at different strengths?

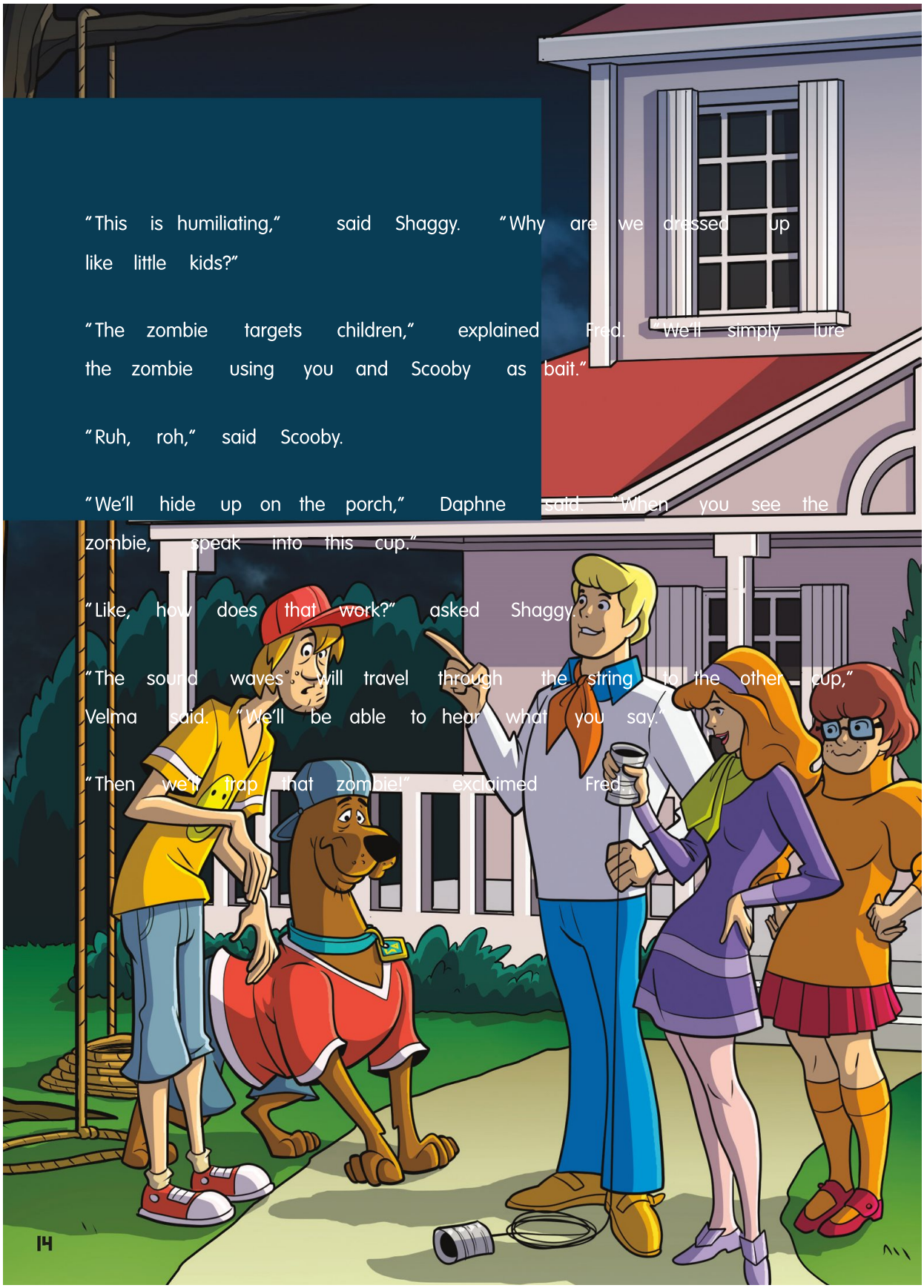
"Like, do we really have to be here?" asked Shaggy
"Mr. Green and the police officer both said the zo
Velma said. "If Mr. Green is responsible, we can
Shaggy pointed toward a shadowy figure. "Not if

"We thought you might be the zombie,

Mr. Green shook his head. "I assure

Suddenly, music drifted into the house
"The zombie's playing the pan flute!"

"Let's go, gang!" shouted Fred. "I have



"This is humiliating," said Shaggy. "Why are we dressed up like little kids?"

"The zombie targets children," explained Fred. "We'll simply lure the zombie using you and Scooby as bait."

"Ruh, roh," said Scooby.

"We'll hide up on the porch," Daphne said. "When you see the zombie, speak into this cup."

"Like, how does that work?" asked Shaggy.

"The sound waves will travel through the string to the other cup," Velma said. "We'll be able to hear what you say."

"Then we'll trap that zombie!" exclaimed Fred.

"Man, that thunder is spookier than any zombie," sai

"Thunder is a huge sound wave," said Daphne. "Whe
it heats up the air around it."

"The heated air expands quickly ," continued Velma.
sound waves. And that makes thunder."

"Luckily, the storm is passing. Quick , everyone into p

It's the z- zombie!

Holy smokes, it worked!

Just then the zombie started playing its terrible tune. Soon the zombie children surrounded Scooby and the gang.

"The zombie has invited its friends!" shouted Daphne.

"Zoinks!" cried Shaggy. "Let's get out of here!"

"Like, all this zombie business is making me hungry," Shaggy said.

"Re roo," agreed Scooby.

"I can hardly even hear the zombie's creepy music anymore," said Shaggy. "What a relief!"

"That's because sound waves lose energy as they travel," Velma explained.

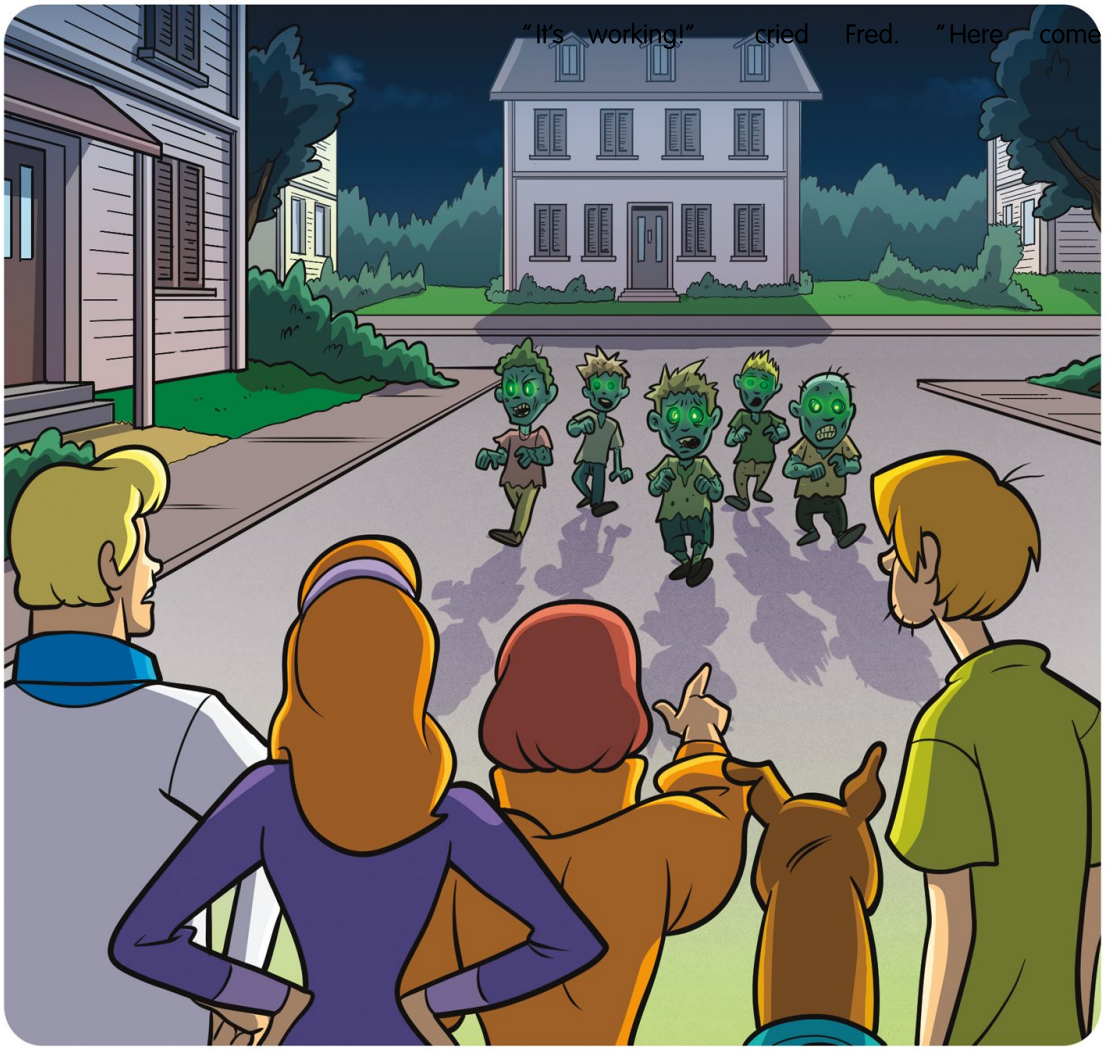
"Velma's right," said Daphne. "The farther away you get from a sound's source, the quieter it gets. Eventually you can't hear it at all."

FACT FILE

Have you ever heard a loud boom as an airplane passes overhead? A shock wave forms behind a plane that is flying faster than the speed of sound. When this wave passes you, it sounds like a boom.

"So, like, what about sirens on an ambulance?" asked
passes by, the siren sounds lower, not quieter ."
"That's called the Doppler effect," Fred said. "As the a
sound waves in front get bunched together. The sound
stretched out."
"Once it passes you, the siren sounds lower," added
the stretched- out sound waves have a lower frequency."
"Yeah, that is freaky!" said Shaggy.
"Not freaky Frequency," Fred corrected. "And a lower
lower pitch."
"Well, science sure sounds freaky to me," said Shaggy.
"Hee, hee, hee, hee!" Scooby laughed.

"Something about those zombie children doesn't sit right
Velma plugged her music player into the Mystery Machine
look at those kids. I downloaded some pan flute music.
children to us."
"Rombies?" Scooby said, spraying donut crumbs.
"Turn up the volume," added Daphne. "Let's make it as l
"Is there, like, a tiny musician playing inside that speaker?"
"Electricity from my player passes into magnets inside th
"The magnets vibrate a cone made of paper. The cone
before sending the sound waves toward your ears."


"It's working!" cried Fred. "Here come th

"Can I have a donut?" asked one of the children as he took off a n
"Like, what is going on here?" Shaggy asked.
"We thought you kids had been turned into zombies!" cried Daphne.
The kid bit into the donut. "We were only pretending," he said. "My neighbor paid us in candy to act like zombies."
"I knew there was something off- key about this," said Velma.

"I found Scooby's old dog whistle the other day," said Velm
is actually a human in disguise, it won't be able to hear
"Like, why not?" asked Shaggy.
"Dogs can hear higher frequencies than people can," exp
"Maybe the same is true for zombies?"
"Look! There's the zombie!" yelled Fred.
"Let's check this zombie's hearing," Velma said, blowing
"Rouch!" shouted Scooby.

"The zombie, like, totally didn't hear that wi
"Which means it's definitely human," added
"Scooby, can you catch that fake zombie?"
"Res!" said Scooby, galloping toward the z

FA

"Time to see who this zombie really is," said Daphne. Scooby pulle off the zombie's mask.

"Sarah?" asked Fred. "Is that you?"

"Yes," the girl admitted. "I was trying to scare away all the adults could run this town."

"But why?" Velma asked.

"I'm really good at government class, remember?" Sarah asked. F "I have brilliant ideas on how to govern this city, but adults won't kids be in charge! I learned about the pan flute zombie in Mr. Gree music class."

"Things are beginning to make sense," said Daphne.

"And I would've gotten away with it if it weren't for you meddling kids!" Sarah shouted.

"But *you're* a kid," Shaggy said.

"Don't remind me," Sarah muttered.

"Well, gang," Fred said. "Now that we've solv
how about we grab some *pan* cakes?"

"That's, like, music to my ears," Shaggy said,

GLOSSARY

cochlea (KOH- klee- uh)— a spiral- shaped part of the sound messages to the brain

Doppler effect (DAH- pluhr uh- FEKT)— the way wave change depending on how a source of waves, such observer move toward or away from each other

electricity (i- lek- TRIS- i- tee)— the movement of electr make light and heat or to make machines work

energy (EN- uhr- jee)— the ability to do work, such as heat or light

frequency (FREE- kwuhn- see)— the number of sound location in a certain amount of time

molecule (MOL- uh- kyool)— the atoms making up th substance; H_2O is a molecule of water

pinna (PIN- uh)— the outer part of the ear

pitch (PICH)— the highness or lowness of a sound; l
frequencies and high pitches have high frequencies

shock wave (SHOK WAYV)— a burst of quickly movir

vibration (vye-BRAY-shuhn)—a fast movement back and f

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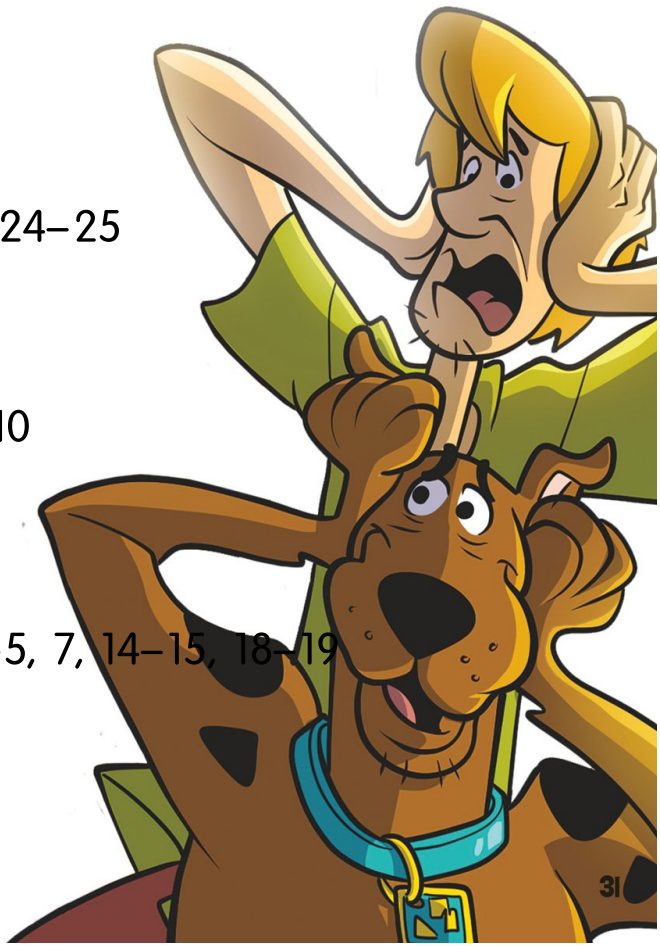

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Thanks to our adviser for his expertise, research,
Paul Ohmann, PhD, Associate Professor of
University of St. Thomas, St. Paul, Minnesc

Published in 2016 by Capstone Press, A Capstor
1710 Roe Crest Drive, North Mankato, Minnesota
www.mycapstone.com

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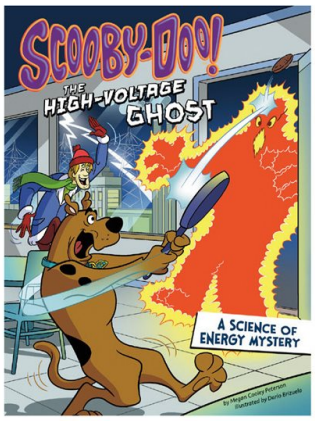
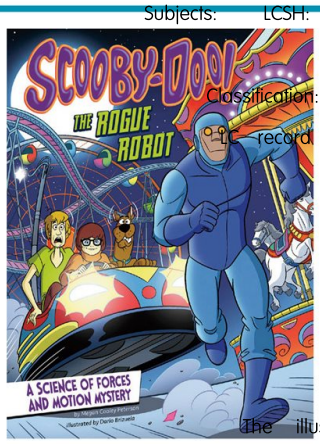
Library of Congress Cataloging- in- Publicatior
Names: Peterson, Megan Cooley, auth
Title: Scooby- Doo! a science of sound mystery : a song for zombies
Description: Science of sound mystery | North Mankato,
Press, a Capstone imprint, [2016] | 2016 | Series:
Scooby- Doo solves it with S. T. E. M. | Includes bibliographi
and index. | Audience: ages 9- 12. | Audience: g
Identifiers: LCCN 2015043266 | ISBN 9781515725930 (library binding) | ISBN 9781515726548 (ebook PDF) | ISBN 978154353920
Subjects: LCSH: Sound— Juvenile literature. | Scooby-
character— Juvenile literature.
Classification: LCC QC225.5 .P45 2017 | DDC
LC record available at http://lccn.loc.gov/201504326

Editorial Credits
Editor: Kristen Mohn
Designer: Ashlee Suker
Creative Director: Nathan Gassman
Production Specialist: Gene Bentdahl

The illustrations in this book were created





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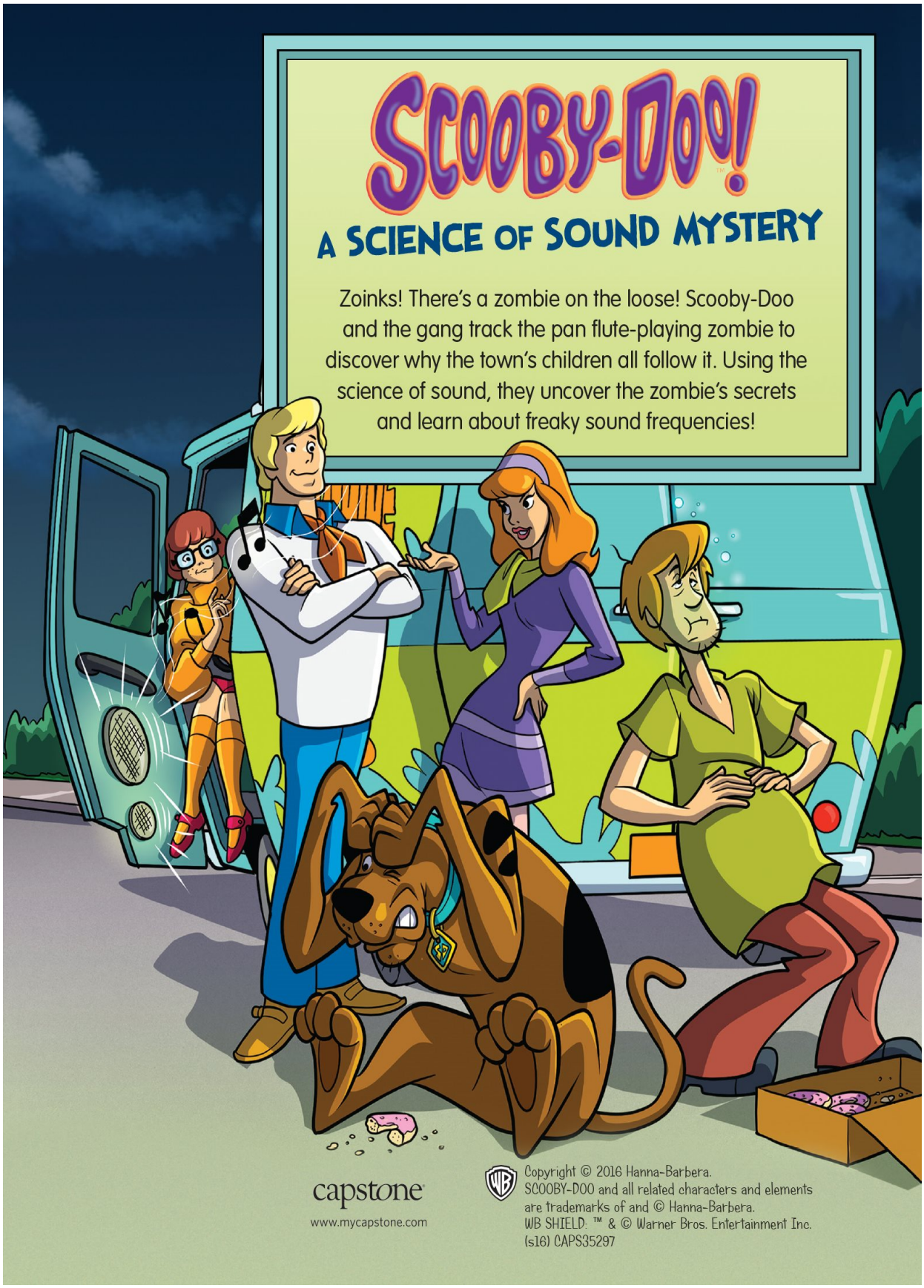
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